

Research Brief – Are the Long-term Contracts Procured Correctly?
Instructor: Dr. Deepak Sharma

Public Private Partnerships (PPPs), commonly known as Toll Road contracts, are long-term non-traditional contractual agreements between public agency and private sector. These contracts allow the private sector to take significantly higher responsibility by letting it design, build, finance, operate and maintain public infrastructure. PPPs in the US are used as an alternate project delivery method and generally preferred when the funds required for a project are not sufficiently available. As per the American Society of Civil Engineers' (ASCE's) report card, US requires an estimated amount of about \$3.6 trillion by the year 2020 for its infrastructure, construction and renovation projects. As a result, the PPPs will be significantly used on public projects.

PPPs are very complex contractual agreements. Government agencies conduct Value for Money (VfM) analysis to determine if PPP are better value than the traditional contractual option where private sector has limited responsibility. PPPs are adopted only when the VfM assessment favors the PPP route. Thus, VfM is the critical gateway that enables (or prevents) government agencies to allow significant private sector participation on public projects.

The VfM analysis relies on long term (generally 30 to 40 years) estimates of interest rates, traffic demand, regional employment growth, population increase and several other factors. Many of these estimates are based on assumptions. As a result the decisions made from VfM analyses are always vulnerable to criticisms and litigations. For example, Long Beach Court House and Presidio Parkway Project in California had been challenged in courts on similar grounds. Although, these projects were found to follow best practices, the few PPPs that failed have left doubts in tax payers' minds about public sector's decision making abilities. This mandates improvement of decision-making processes to restore public confidence in PPP projects.

At California State University Fullerton I have focused on improving the VfM assessment. I have developed decision making and artificial intelligence (AI) tools for PPPs. These are described here:

1. I have developed two advanced linear programming models namely, **Data Envelopment Analysis (DEA) and Interval Data Envelopment Analysis (IDEA)** models, to improve VfM. These models allow integrating VfM's qualitative and quantitative outcomes.
2. VfM assessment is also used for risk transfer between public and private parties. The current VfM assessment ignores project's exogenous risks. I have successfully developed **Bayesian Networks (BNs)** for VfM and have demonstrated that BN can supplement the VfM assessment.

Both these approaches enhance decision making process and increase transparency in decision process. I have presented these works at conferences and working on journal manuscripts. The work completed by student at CSUF could be used for journal papers and future grants.

If this work is supported through Students International Research Institute (SIRI) students will get a first-hand experience of research work in contract management.